

Document Projet / Project Document



**GLAST LAT CAL**  
*Mechanical Structures*

Ref : GLAST-LLR-PL-026

Issue : Draft

Date : November 25, 2002


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*Product Assurance (PA) Plan*

SLAC reference : LAT-SS-00971-01


**Change History log**

draft	November 25, 2002		S. Le Quellec		P. Dupont	O. Ferreira
<b>Ind.</b>	<b>Date</b>	<b>Modifications</b>	<b>Prepared</b>	<b>Checked</b>	<b>PA Approval</b>	<b>Project Approval</b>

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### **List of Acronyms**

AIT/V	Assemblage, Integration et Test / Verification	Assembly, Integration & Test / Verification
AFEE		Analog Front-End Electronic
CAL	sous-système calorimètre du LAT	LAT subsystem
CDE		Crystal-Diode Element
CEA	Commissariat à l'Energie Atomique	
CNES	Centre National d'Etudes Spatiales	
DCI	Dossier de Contrôle des Interfaces	
DCF	Dossier de Fabrication et de Contrôle	
DD	Dossier de Définition	
DJD	Dossier Justificatif de la Définition	
EM		Engineering Model
EMC		Electromagnetic Compatibility
EGSE		Electric Ground Support Equipment
GLAST		Gamma-Ray Large Area Telescope
LAT		Large Area Telescope
LLR	Laboratoire Leprince-Ringuet	
LPNHE	Laboratoire de Physique Nucléaire des Hautes Energies	
NRL		Naval Research Laboratory
PCB		Printed Circuit Board
SLAC		Stanford Linear Accelerator Center
STB	Spécification Technique de Besoin	
TBR		To Be Resolved
TBD		To Be Defined
TBC		To Be Confirmed

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## 1 Introduction

### 1.1 Overview

GLAST is a next generation high energy gamma-ray observatory designed for making observations of celestial gamma-ray sources in the energy band extending from 20 MeV to more than 300 GeV. It follows in the footsteps of the Compton Gamma Ray Observatory EGRET experiment, which was operational between 1991-1999. The GLAST Mission is part of NASA's Office of Space and Science Strategic Plan, with launch anticipated in 2006. The principal instrument of the GLAST mission is the Large Area Telescope (LAT) that is being developed jointly by NASA and the US Dept. of Energy (DOE) and is supported by an international collaboration of 26 institutions lead by Stanford University.

The GLAST LAT is a high-energy pair conversion telescope that has been under development for over 7 years with support from NASA, DOE and international partners. It consists of a precision converter-tracker (TKR), CsI hodoscopic calorimeter (CAL), plastic scintillator anticoincidence system (ACD) and a data acquisition system (T&DF).

The GLAST LAT Calorimeter (CAL) subsystem consists of 16 identical modules arranged in a  $4 \times 4$  array that is defined by the LAT support grid structure. Each CAL module is made of:

- 1 mechanical structure,
- 96 CDE (CsI crystal, wrapped in reflective material and equipped with dual PIN photodiodes), arranged horizontally in 8 layers of 12 crystals each. Each layer is aligned  $90^\circ$  with respect to its neighbors, forming an x-y array,
- 4 electronics cards for signal processing.

LLR participation in the GLAST program consists in the development and delivery of the CAL mechanical structure (see figure below), which is composed of:

- a carbon composite structure on which are attached Titanium inserts,
- an aluminum baseplate which presents the structural I/F to the LAT grid structure,
- an aluminum top frame,
- 4 aluminum close-out plates,
- 4 aluminum side panels that provide shielding.

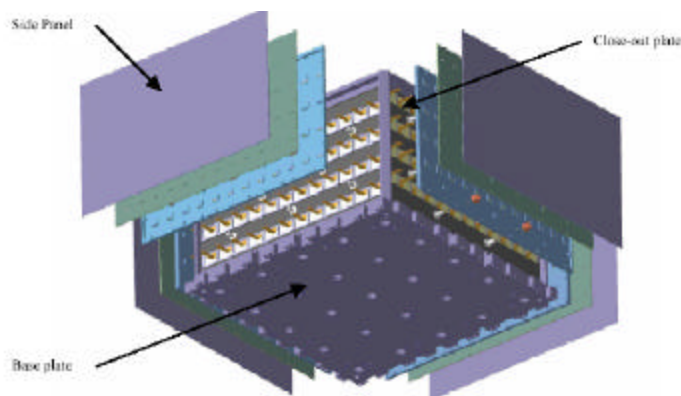




Figure 1-1 – exploded view of CAL mechanical structure

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## **1.2 Scope of the document**

This document presents the product assurance objectives, policies, methods & procedures that will be implemented @ LLR throughout the CAL mechanical structure development phases, from design stages upon delivery to NRL.

This plan has been prepared in accordance with the GLAST program overall PA requirements and is based on experience gained through various space programs. It is designed to ensure achievement of all contractual requirements for product assurance.

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## 2 Documents

### 2.1 Applicable documents

All Applicable Documents are listed in the AD chapter of the CIDL (GLAST-LLR-LI-029).

### 2.2 Reference documents

	<i>Title</i>	<i>Reference</i>	<i>Iss</i>	<i>Rev</i>	<i>Date</i>
RD01	LAT Calorimeter Subsystem Preliminary Design Report	LAT-TD-00242		1	August 14, 2001
RD02	STANDARD Product assurance plan for Space Instruments	SAP-GERES-FLo-436-00	1	0	07/11/00
RD03	Constitution d'un ADP	SAP-GERES-FLo-97-356	1	3	04/03/99
RD04	Contamination & Cleanliness Control	ESA PSS-01-201	1		August 1983
RD05	MAIV Plan	GLAST-LLR-PL-015	draft		

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### 3 PA Management

#### 3.1 General

This plan is applicable to all deliverable CAL mechanical structures, as described in the table below:

Chapter #	PA Requirements	CAL Mechanical Structures models		
		EM,EM2	FMA, FMB	FM1⇒ 16
3	PA Management	A	A	A
4	Material & Process Selection & Control	A	A	A
5	EEE Parts Selection & Control	N/A	N/A	N/A
6	Cleanliness & Contamination Control	P	A	A
7	Reliability Assurance	A	A	A
8	Safety Assurance	A	A	A
9	QA Assurance	P	A	A
10	Software Product Assurance	N/A	N/A	N/A
11	Configuration Management & Control	P	A	A

A: Applicable

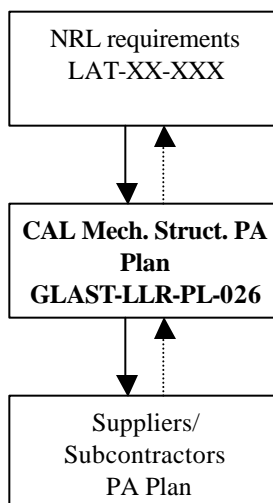
N/A: Not Applicable

P: Partially Applicable

**Table 3-1 : applicability of PA Program to the different models**


If necessary, this plan will be tailored to the needs of the suppliers (see also § 3.5).

The relation of this plan to higher & lower levels is presented in Figure 3-1.



**Figure 3-1: relation between PA documents at different levels**



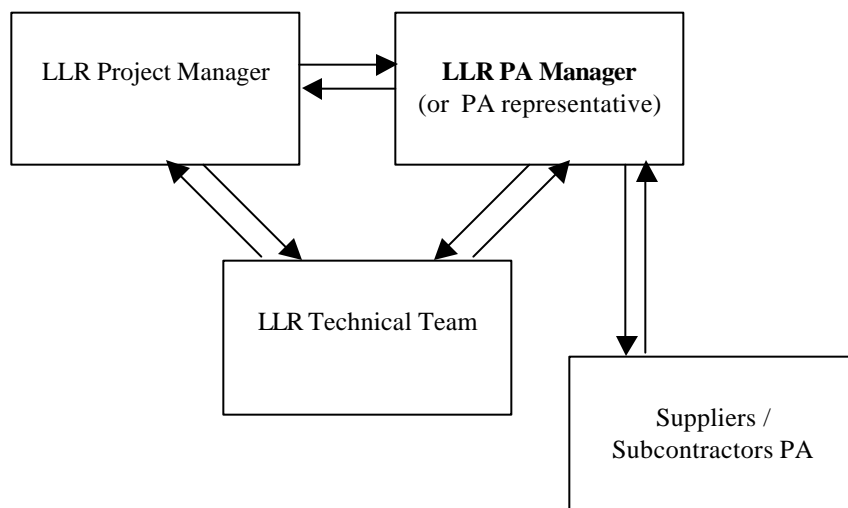
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### 3.2 Organization

LLR has appointed a dedicated PA Manager (Mr Patrick DUPONT) who is responsible for the implementation and verification of the PA requirements related to the CAL Mechanical Structures. He will be present at LLR facilities whenever needed and will report directly to the LLR Project Manager.

Additionally, a LLR PA representative (Mss Sandrine LeQuellec), located at LLR premises, has been appointed and is in charge of the daily PA activities and Configuration Control. She will report to both the PA & Project Manager.

Note that whenever required the PA Manager will be assisted by specialists or experts.



**Figure 3-2 : PA organization @ LLR**

### 3.3 Right of Access

For purpose of Product Assurance or technical coordination, NRL representatives will have access to LLR facilities whenever required (participation to KIP & MIP, audits, reviews, etc.).

Note that proprietary rights should be fully respected.

### 3.4 Critical Items Identification & Control


Based on our analyze, no Critical Item were detected.

### 3.5 Management of Subcontractors

Whenever contractors are employed to provide service or equipment, the PA requirements listed in this document will be imposed, tailored to the criticality of the services or products being provided.

Surveillance of PA activities will be carried out by LLR PA Manager (or its representative) who will ensure that appropriate inspections, tests and documentation are specified and completed.

Contractors shall be assessed on the basis of their Product Assurance in addition to their technical capabilities.

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### **3.6 PA Planning & Documentation**

This PA Plan will be a controlled document and should be approved by LLR PA Manager.

All project documents (plans, specifications, procedures and design documentation) will be reviewed for compliance with PA requirements, signed-off and submitted to Configuration Control as explained in § 11.

PA events will appear in the project planning. This planning will be updated on a regularly basis and sent to NRL for review.


### **3.7 Reporting**

Reporting on the progress and status of Product Assurance matters will form part of the regular project reporting procedure and will include information on:

- Status of material & processes control program,
- Status for Non-Conformances & Request for Waivers,
- Status of contamination Control Program,
- Overview of major events in the forthcoming period,
- Etc.

### **3.8 Training & Certification**

LLR ensures that only experienced technicians will be involved in manufacturing and assembly operations. There skills will be evaluated before the beginning of operations. If necessary they will follow additional training courses and certification programs.

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## **4 Materials & Processes Selection & Control**

### **4.1 General**

LLR PA Manager has the responsibility for selecting materials & processes and for demonstrating their suitability for the intended application.

### **4.2 Control & Selection of Materials & Processes**

Preferably materials & processes that have successfully been applied to previous space projects will be selected.

Materials & Processes which cannot be considered either space proven or standard / established shall be subjected to an evaluation program to assess the suitability for the intended application. This program will be submitted to the upper level PA Manager for approval. Evaluation reports will be issued after qualification.

Description of processes carried-out by subcontractors shall be made available to the PA Manager so that they can be evaluated. If these descriptions cannot be delivered (ie for commercial reasons), a Certificate of Conformity should be established by the subcontractor.

### **4.3 Materials Procurement**

Materials procurement will be made in accordance to dedicated specifications. Certification to mechanical properties, chemical composition & lot traceability, as a minimum, will be included if appropriate.

### **4.4 Limited Shelf Life Materials**

A system to control Limited Shelf Life Materials (such as adhesives or prepreg) will be established.

### **4.5 Critical Processes**


Application of critical processes will be either witnessed by PA Manager (or his representative) and/or will be evaluated on reference samples.

### **4.6 Reporting & Documentation on Materials & Processes**

A Declared Materials List (DML) and a Processes Declared List (DPL) will be issued and submitted to the approbation of NRL PA Manager.


### **4.7 Request for Approval**

Requests for Approval (RFA) will be issued when no sufficient application or qualification history does exist and additional evaluation is required to cover the application. RFA will summarize the proposed evaluation activities.

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## 5 EEE Parts Selection & Control

This chapter is not applicable in the scope of this Project.

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## **6 Cleanliness & Contamination Control**

### **6.1 General**

LLR PA Manager has the responsibility for defining cleanliness rules applicable for all the activities related to the development of the CAL Mechanical Structures H/W at LLR or subcontractors premises and for the application of these rules.

All operations related to this H/W shall be recorded. The records shall include reference or description of the related cleaning, cleanliness monitoring and cleanliness protection operations.

Any Non-Conformance to this plan shall be managed according to the LLR NCR management process (see § 9.5).

### **6.2 Manufacturing activities**

Excepted for the EM model, these activities are mainly performed at subcontractor's facilities. Instruction relative to the cleanliness constraints will be given to the subcontractors.

Concerning the manufacturing process, it is demanded for the parts to be cleaned and packed separately. The cleaning procedure will be reviewed and approved by LLR.

The assembly activities to be performed out of LLR will be submitted to the same rules. As far as possible, subassemblies will be cleaned following LLR procedure after each of the assembly processes.

### **6.3 Assembly, Integration & Test activities**

These activities will mainly be performed in LLR premises. In order to meet the cleanliness & contamination requirements, we plan to use dedicated facilities, such as a cleanroom (controlled area).

#### **6.3.1 Access to cleanroom**

Access to LLR facilities is restricted to certified personnel.

Access to occasional visitors is only possible pending specific authorization of LLR Project manager or PA manager.

#### **6.3.2 Cleanroom**

A cleanroom has been set-up to ensure the required level of cleanliness of the CAL Mechanical Structures. Its main characteristics are defined in doc [RD05], § 10.1.

#### **6.3.3 Cleaning Procedure**

A cleaning procedure taking into account the cleanliness & contamination requirements has been issued GLAST-LLR-PR-032.

#### **6.3.4 Storage**

Even under cleanroom conditions, CAL Mechanical Structures H/W will be protected during non-activity.


The protection will be assured by one of the following:

- Dedicated transport container
- Clean covers
- Clean packing materials

### **6.4 Handling, Packing & Shipping**


Handling, Packing & Shipping will be performed such as to avoid any damage to the CAL Mechanical Structures and to ensure the required levels on cleanliness & contamination.

A dedicated procedure has been issued GLAST-LLR-PR-022 (see also § 9.4.6.).

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Handling of the CAL Mechanical Structures or any related items will only be done by skilled and certified personnel and using dedicated gloves.


Transportation of H/W will always be done using dedicated containers. The structures will be bagged in sealed bags, filled with dry Nitrogen, in order to provide the required level of cleanliness. Then, the structures will be placed in the container, filled with foam & equipped with shock & humidity sensors.

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## 7 Reliability Assurance

### 7.1 General

Reliability analysis will be conducted by NRL. Results should be communicated to LLR if it impacts the design.


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## **8 Safety Assurance**

### **8.1 General**

Potential hazards to personnel and Flight Hardware will be identified and actions will be taken in order to eliminate them or reduce them to acceptable levels. This will apply throughout the MAIV phases.



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## **9 QA Assurance**

### **9.1 General**

LLR PA Manager will be responsible for the implementation of QA requirements throughout the project life. He will participate to preparation of materials, components, processes and manufacturing specifications in cooperation with designers and test engineers. In all cases PA Manager will review and approve specifications to safeguard PA requirements.

### **9.2 Procurement**

#### **9.2.1 Selection of Procurement sources**

Manufacturers and suppliers will be selected for their proven ability to supply materials & components parts to the required specifications together with the adequate documentation to verify that the requirements of the procurement specification have been met. Procurement sources will preferably have previous experience in supplying space-qualified items or materials.

#### **9.2.2 Procurement Documents**

Procurement documents and purchase orders will be reviewed for implementation of PA requirements.

#### **9.2.3 Surveillance**

LLR PA Manager (or its representative) will carry out surveys of facilities and Product Assurance Systems for critical materials and/or processes.

#### **9.2.4 Incoming Inspection**

All materials and assemblies will be inspected for compliance with the purchase order and specification. These records will be maintained and the database will be updated. An example of Incoming Inspection Record Sheet (Fiche d'Inspection) is given in annex A-1.

Incoming Inspections will include: review of the Certificate of Conformance & delivered documentation, visual inspection, and if needed testing and/or verification of critical parameters (i.e. dimensional check of specific parts).

### **9.3 Manufacturing & Assembly Control**

#### **9.3.1 Documentation**

The Manufacturing and Assembly processes will be analyzed and the sequence of the various steps thoroughly planned. LLR PA Manager (or its representative) will perform surveillance of manufacturing and assembly activities, by means of inspection, for critical parameters of the processes & satisfactory workmanship.


Manufacturing and Assembly of CAL Mechanical Structures will be supported by appropriate documentation that will give full traceability. This documentation will comprises, as a minimum:

- MAIV Flow Chart including relevant inspections,
- Drawing List defining items to be manufactured,
- Declared Materials List & Declared Processes List,
- Manufacturing & Inspection Records.

If needed, in-house procedure will be developed for the project. These procedures will be written in French.

#### **9.3.2 Reviews**

A Formal Review will be held prior to release drawings for manufacturing.

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### **9.3.3 Metrology & Calibration**

All special tools & measuring equipment to be used on the CAL Mechanical Structures Project will be submitted to a calibration program.

They will also be marked. The mark will include (as a minimum):

- serial number,
- last & next date for calibration & maintenance.

A list of those special tools & measuring equipment will be issued and maintained by QA.

### **9.3.4 Inspection Points**

KIP & MIP will be identified in the MAIV Flow Chart and will be reported in the associated planning, so that upper level representatives will be kept informed and could attend these Inspection Points if desired.

### **9.3.5 Storage**

Materials will be stored in the dedicated cleanroom. Dedicated shelves will be used to store all materials & components. These shelves will be located in a dedicated area and will only be accessible to authorized personnel.

## **9.4 Integration & Test Control**

### **9.4.1 Test Procedures**

Tests procedures will be issued for Qualification & Acceptance Tests. They will contain, as a minimum:

- Definition of Hardware under test,
- Test objective,
- Test sequence,
- Success criteria,
- Facilities & support equipment,
- Environmental conditions,
- Hazards/Risks (if any).

These procedures will be fulfilled while playing ("as run" procedure). NCR or open points, if any, will also be reported on the "as run" summary.

### **9.4.2 Test witnessing**

Qualification & Acceptance Tests will be witnessed by PA to ensure that relevant procedure is followed and that adequate records of the activities & test results are taken.

### **9.4.3 Reviews**


*A Test Readiness Review (TRR) will be held before the start of each Qualification & Acceptance test. The aim of this review is to verify:*

- *the configuration under test ("as build" configuration),*
- *approval status of required documentation,*
- *the status of the Non-Conformities, Open Work, Waivers,*
- *readiness of test facility & associated equipment.*

*This review will give the agreement to proceed for testing.*

*After the tests, a Post-Test Review (PTR) will be held to assume that:*

- *no degradation of the tested equipment has occurred,*
- *test procedures have been completed,*
- *records of test data have been properly made,*
- *success criteria have been met.*

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*This review will give the agreement to proceed to the release of the test article.*

*Test Review Boards will include, as a minimum, Project Manager, PA Manager, AIV Manager. Upper level representatives will be invited.*

*Nota : All reviews will be documented by minutes of meeting.*

#### **9.4.4 Test Reports**

A Test Report will be issued for each test that and will include, as a minimum:

- a summary of test results,
- a list of NCR raised during testing,
- the "as run" procedure,
- test data,
- environmental control data,
- conclusion.

#### **9.4.5 Logbook**

A Logbook will be established for each of the equipment that will trace all operations and tests starting with the final inspection of the Hardware after the manufacturing/assembly phase.

This Logbook will be part of the Acceptance Data Package (ADP).

It will include (as a minimum):

- appearance of Non-Conformances and corrective actions taken,
- list of tests or controls carried out.

#### **9.4.6 Handling, Storage, Packaging, Marking & Labeling**

A dedicated procedure will be issued explaining how to identify, safely handle and store the various CAL Mechanical Structures, taking into account the contamination & cleanliness requirements.

Effective implementation of this procedure will be verified by QA.

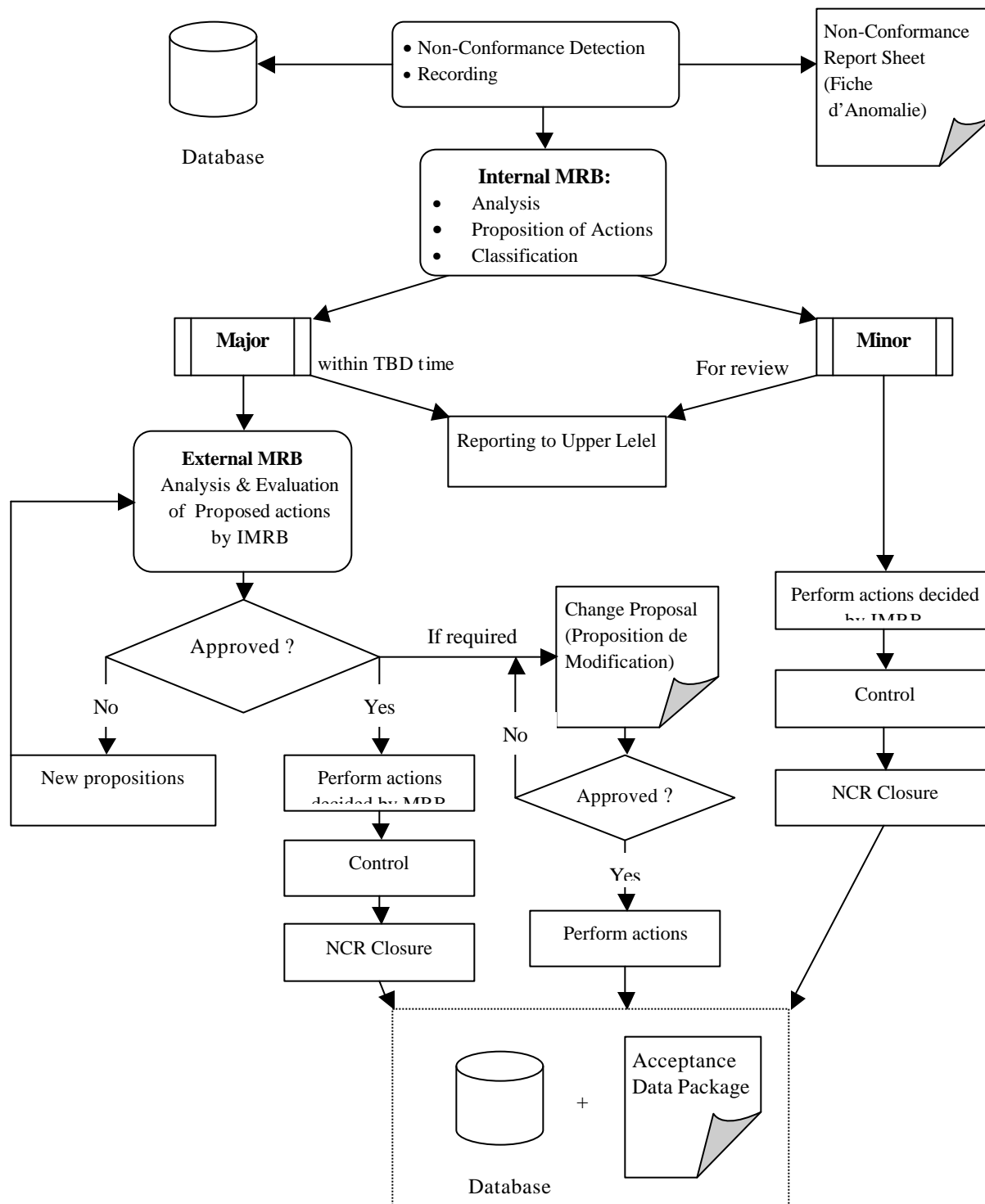
Transportation of CAL Mechanical Structures will be done using a dedicated container.

### **9.5 Non-Conformances Control**


#### **9.5.1 General**

PA Manager will set-up a Non-Conformances Control system. He will be responsible for its effective application throughout the project life.

### 9.5.2 Non-Conformance Control System



**Figure 9-1 : NCR treatment flow diagram**

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### 9.5.2.1 Non-Conformance Detection

#### Immediate action:

As soon as a Non-Conformance is detected, the following steps will be applied:

- maintain in its current state the item under review,
- prevent it from any degradation that may result from this Non-Conformance,
- mention the Non-Conformance on the document used to support the activity at this time (Inspection Record Sheet, Logbook, Procedure, ...),
- inform the PA Manager & the Project Manager so they can decide how to manage it.

#### Recording

If the Non-Conformance is confirmed, it is recorded on a dedicated record sheet (Non-Conformance Report (NCR) – see example in annex A-2). This NCR is then put under configuration by QA that will give it a unique number and update the database. This number is to be reported on the document supporting the activity at this time.

### 9.5.2.2 Internal MRB

In order to analyze the Non-Conformance, an Internal Material Review Board (IMRB) will be held, which purposes are:

- to identify the causes of the Non-Conformance,
- to evaluate the consequences,
- to propose corrective & preventive actions,
- to propose a classification.

This Board will be chaired by PA Manager and will be composed of the Project Manager and further specialists on request.

### 9.5.2.3 Action Propositions

MRB will issue corrective & preventive action propositions that will be fully documented. The nature of these actions can be :

- ‘scrap’,
- ‘use as is’, (note that if a specification requirement remains violated, a Request for Waiver (RFW) will be issued and submitted for approval),
- ‘repair’,
- ‘modification’ (in this case a formal Change Proposal will be issued and submitted for approval).

These action propositions will be mentioned on the NCR or in the MRB minutes.

### 9.5.2.4 Upper Level Notification

Once issued and recorded, the NCR is sent to the affected entities. If the NCR is classified as Major, it will be sent under TBD times to the upper level. Minor ones will also be sent to upper level for review.


### 9.5.2.5 External MRB

If a Non-Conformance is classified as Major, an External MRB (EMRB) will be held with upper level representatives. Its purposes are to analyze the actions proposed by the IMRB and to approve them or not. If not, new propositions should be issued.

This MRB will be composed, in addition to IMRB, of the upper level PA Manager, Project Manager and further specialists on request.

### 9.5.2.6 Performing of Actions & Control

The person in charge of the activity will implement the proposed & approved actions. QA will ensure that these actions have been properly implemented.

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#### 9.5.2.7 Change Proposal

In case of modification, a formal Change Proposal will be issued and submitted for approval. This Change Proposal will be submitted to Configuration Control.

#### 9.5.2.8 Closure

Once the appropriated actions are realized & controlled, the NCR will be formally closed. For that purpose it should be signed off by PA Manager.

The NCR database will also be updated.

In any case, all NCR relative to equipment should be closed before equipment delivery.

#### 9.5.2.9 NCR resulting from a subcontractor


Any Non-Conformance that occurred at one of the contractor's premises will be noted on an LLR NCR and the database will be updated.

#### 9.5.2.10 NCR Database

A database will be issued (Excel file) in order to ensure full traceability of problems occurring during MAIV phases. An example of such a file is given in Annex A-3.

#### 9.5.2.11 NCR Reporting

The NCR status report will be presented at equipment reviews (TRR, PTR, DRB, ...) and be part of the Acceptance Data Package.

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## **9.6 Acceptance & Delivery**

### **9.6.1 Delivery Review Board**

Upon completion of final test & inspection and prior to shipment of any deliverable item, a Delivery Review will be held. The purpose of this review is to ensure that there is adequate documentary evidence to demonstrate that the equipment has satisfied all requirements and identify any possible open work.

The following topics will be reviewed (not exhaustive):

- status of deliverable item ("as build" configuration),
- review Change Proposal status,
- evaluation of test results,
- status of waivers,
- cleanliness status (if required),
- review of deliverable documentation.

The DRB will be composed, as a minimum, of the equipment's PA & Project Managers & upper level's PA & Project Managers.

### **9.6.2 Acceptance Data Package**

An Acceptance Data Package (ADP) will be issued to provide the upper level with sufficient information to continue their work without continuous support of the supplying party. Nevertheless, support can be provided on request.

The ADP will comprise, as a minimum:


- Certificate of Conformity,
- Configuration file ("As built" status),
- LogBook,
- Drawings,
- List of applicable modifications & NCR,
- Mass table & overall dimensions,
- Shipping documents,
- Packing, Handling & Transportation Procedure
- Mounting & Dismounting Procedure
- Test Reports

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## 10 Software Product Assurance

This chapter is not applicable in the scope of this Project.



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## **11 Configuration Management & Control**

### **11.1 General**

A Configuration Management System will be issued to provide systematic and uniform configuration identification, control & accounting of an deliverable item throughout the design, development, fabrication & testing up to and including its acceptance by the upper level authority.

It will be composed of a document database and several configuration files (one per deliverable item – see example in annex A-4).

### **11.2 Configuration Items**

LLR Configuration Items include:

- Deliverable Items (Mechanical Structures EM, FMA, FMB, FM1 ⇒ 16),
- Relevant Documentation (applicable documents & project documents).

### **11.3 Configuration Items Data List (CIDL)**

For each Deliverable Item a CIDL will be issued. This CIDL will be composed of:

- List of applicable documents,
- List of drawings,
- List of project documents,
- List of NCR,
- Configuration File of the Deliverable Item.

This list will be updated for each review and will give the current status of the Deliverable Item.

### **11.4 Documentation Control**


#### **11.4.1 Project documents Identification**

Documentation generated by LLR will be referenced as explained below:

**GLAST-LLR-xx-nnn-I-R**

With:

GLAST identifies the project  
 LLR identifies the institute  
 xx identifies the type of the document (see table below)  
 nnn is a sequential number which comes from the documentation database  
 I Issue of the document  
 R Revision of the document

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FC	Flow Chart
ICD	Interface Control Document
LI	List
MN	Minutes of Meeting
PL	Plan
PR	Procedure
QA	Quality Assurance
RP	Report
SP	Specification
TN	Technical Note

**Table 11-1: Project document identification**

#### **11.4.2 Drawings identification**

Documentation generated by LLR will be referenced as explained below:


### **GLT-LLR-yy-nn-V**

**With:**

GLT	identifies the project
LLR	identifies the institute
yy	identifies the type of the document (see table below)
nn	is a sequential number which comes from the documentation database
V	Version of the drawing (A, B, etc)

00	Mech. Structures
10	Manufacturing Tooling
20	Other Tooling
90	Specifications drawings

**Table 11-2: Drawings identification**

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#### **11.4.3 Storage**

Project documents will be stored using their reference (eg GLAST-LLR-PL-001-1-0.doc). Other documents will keep their original names.

Documents under configuration control will be stored in a dedicated directory so that they can only be accessed in a read-only mode.

#### **11.4.4 Server organization**

The structure adopted for organizing our server is presented in annex A-5.

#### **11.4.5 Backup**

Backup will be performed on a weekly basis on CD-ROM.

### **11.5 Approval Procedure**

Project documents will be reviewed & approved by both PA & Project Managers. They will also be submitted to upper level management for approval.

### **11.6 Configuration Status Accounting**


A database will be generated, which will trace all documents associated to the qualification of the equipment. Configuration files will also be maintained for each article reflecting its current status ("as built").

### **11.7 Change Processing**

Changes to an approved configuration are only possible after formal approval. Change Requests (CR) will be issued and discussed with upper level authorities if affecting I/F or approved documentation.

### **11.8 Implementation Verification**


Implementation verification will ensure that the as-designed configuration, which is specified in the database, is consistent with the actual hardware implementation.

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## **Annexes**

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**Annex A- 1 : example of Incoming Inspection sheet**

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	<b>Fiche d'Inspection</b> <i>Inspection Sheet</i>	Réf. n° GLAST-LLR-PL-026 Page ... / ...
		Rapport / Report

 Centre National de la Recherche Scientifique	 IN2P3	 Ecole Polytechnique
<b>Fiche d'Inspection</b> <i>Inspection Sheet</i>		Référence : GLAST-LLR-PL-026 Page 1/...
Type d'inspection / Inspection Type		
<input type="checkbox"/> 1. Approvisionnement <input type="checkbox"/> 2. Equipement	<input type="checkbox"/> 3. Réception pièces <input type="checkbox"/> 4. Autre	Date : Nom & signature :
Type de contrôle / Control type		
<input type="checkbox"/> 1. Visuel <input type="checkbox"/> 2. Dimensionnel	<input type="checkbox"/> 3. Fonctionnel <input type="checkbox"/> 4. Autre	
Renseignements concernant l'équipement à inspecter :		
Modèle concerné :		
Nom et réf. item :		
Fabricant :		Sous traitant :
Renseignements qualité :		
Certificat de Conformité		Référence spéc. :
Certificat Matière		Référence spéc. :
PV contrôle :		Référence spéc. :
Anomalie(s) : <input type="checkbox"/>		Si oui, Ref. FA :
Visa Projet - Nom, date et signature :		
Visa Qualité - Nom, date et signature :		

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**Annex A- 2 : example of Non Conformance Report sheet**

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**Fiche d'Anomalie  
Non Conformance Report  
Sheet**

Référence :  
GLAST-LLR-FA-...  
Page 1/...


Suivi des actions :  
Date :

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**Référence DM :**

**Dispositions finales :**

<input type="checkbox"/> En l'état	<input type="checkbox"/> Modification	<input type="checkbox"/> Réparation	<input type="checkbox"/> Dérogation	<input type="checkbox"/> Rebut
Autorisation pour dispositions et actions		Responsable AP		Chef de projet
Entité responsable		P. Dupont		L. Duband
Niveau supérieur		Par :		Visa :
Clos le :				



**Fiche d'Anomalie  
Non Conformance Report  
Sheet**

Référence :  
GLAST-LLR-FA-...  
Page 1/...

Date :  
Nom de l'émetteur :

**Intitulé fiche d'anomalie :**

**Renseignements concernant l'équipement :**

Modèle concerné :  
Nom et réf. item :  
Nom et réf. item :

**Phase de constat et conditions d'environnement :**

<input type="checkbox"/> Fabrication	<input type="checkbox"/> Recette	<input type="checkbox"/> Intégration	<input type="checkbox"/> Test	<input type="checkbox"/> Autre
<input type="checkbox"/> Ambiante	<input type="checkbox"/> Vide thermique	<input type="checkbox"/> Vibration	<input type="checkbox"/> Vide / Pression	<input type="checkbox"/> Autre

**Description de l'anomalie :**

**Analyse :**

**Classification** ☐ Majeure ☐ Mineure

**Actions correctives :**

**Actions préventives :**

**Recommandations :**



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**Annex A- 3 : example of Non Conformance Report database**



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A	B	C	D	E	F	G	H	I	J	K	L
	Référence			Désignation	Date d'ouverture	Initiateur	Phase	Modèle	Classification	Statut	Date de fermeture
1	LLR-GLAST-NCR- 001 -			Flex cable failure after the 2nd vibration test on the LM2	27-avr-02	P.Prat	Tests de validation	LM2			NC
2	LLR-GLAST-NCR- 002 -			Performance tests non conform after the 2nd vibration test on the LM2	27-avr-02	P.Prat	Tests de validation	LM2			NC
3	LLR-GLAST-NCR- 003 -										
4	LLR-GLAST-NCR- 004 -										
5	LLR-GLAST-NCR- 005 -										
6	LLR-GLAST-NCR- 006 -										
7	LLR-GLAST-NCR- 007 -										
8	LLR-GLAST-NCR- 008 -										
9	LLR-GLAST-NCR- 009 -										
10	LLR-GLAST-NCR- 010 -										
11	LLR-GLAST-NCR- 011 -										
12	LLR-GLAST-NCR- 012 -										
13	LLR-GLAST-NCR- 013 -										
14	LLR-GLAST-NCR- 014 -										
15	LLR-GLAST-NCR- 015 -										
16	LLR-GLAST-NCR- 016 -										
17	LLR-GLAST-NCR- 017 -										
18	LLR-GLAST-NCR- 018 -										
19	LLR-GLAST-NCR- 019 -										
20	LLR-GLAST-NCR- 020 -										
21	LLR-GLAST-NCR- 021 -										
22	LLR-GLAST-NCR- 022 -										
23	LLR-GLAST-NCR- 023 -										
24	LLR-GLAST-NCR- 024 -										
25	LLR-GLAST-NCR- 025 -										
26	LLR-GLAST-NCR- 026 -										


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#### **Annex A- 4 : example of Configuration File**



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#### **Annex A- 5 : LLR server organization**

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